



# Air Force Research Laboratory | AFRL

*Science and Technology for Tomorrow's Aerospace Forces*

## Success Story

### AFRL DEVELOPS “FANTASTIC” APPROACH TO AIR TRAFFIC CONTROL RESTRICTIONS



The Information Directorate is developing a cost-effective solution for upgrading US Air Force tactical fighter and civilian platforms in an effort to meet new and evolving air traffic control restrictions imposed by the Federal Aviation Administration and international governing bodies. The program is called Future Air Navigation and Traffic Avoidance Solution Through Integrated Communications, Navigation, Surveillance (CNS) (FANTASTIC).



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### **Accomplishment**

FANTASTIC targets Air Combat Command tactical aircraft, such as the F-15E and F-16CJ, whose size/weight/power restrictions preclude the use of commercial equipment to meet the new and evolving air traffic control restrictions. The directorate's Information Grid Division, Platform Connectivity Branch, working with Rockwell-Collins scientists and engineers, found that non-compliance with Air Traffic Control requirements impacts both cost and mission. Restrictions could range from non-preferred routes and operating altitudes to precluding certain missions altogether.

Directorate engineers recently demonstrated FANTASTIC's fully compliant hardware/software system that weds a unique blend of a state-of-the-art receiver/processor with Future Air Navigation System (FANS) certified software, currently employed in the air transport fleet. The FANTASTIC program-developed receiver/exciter, called the Miniature Modular Digital Radio, employs commercial-off-the-shelf components, patented software, and a direct conversion receiver architecture, meeting all global air traffic management (GATM) requirements in an incomparable combination of small size and low cost. Engineers combined a Fast In-Phase/Quadrature processor to provide a baseline for a radio system in two standard electronic module, type E modules. Commercial software from Rockwell-Collins' Air Transport Division provides significant cost containment.

### **Background**

Rockwell-Collins transitioned interim products from the FANTASTIC program to military and civilian applications. They loaned the receiver/processor pair to the military's Airborne Communications Node program for the Phase 1 demo with planned transition to the F-22, Joint Strike Fighter, and Comanche, saving hundreds of millions of dollars. They also transitioned very high frequency (VHF) data link and communications management software to the ARC-210 radio. The general aviation market business and personal aircraft are the primary civilian targets of the FANTASTIC program. Products transitioned to the commercial sector include VHF data link software insertion into the general aviation and air transport VHF radios.

The Office of the Secretary of Defense (Science and Technology) recently recognized the FANTASTIC program as a recipient of the first annual Dual Use Award.

### **Additional information**

To receive more information about this or other activities in the Air Force Research Laboratory, contact TECH CONNECT, AFRL/XPTT, (800) 203-6451 and you will be directed to the appropriate Laboratory expert. (00-IF-06)